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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,950	07/24/2003	Ray R. Radtkey	612,404-426 US 313C2	2426

34263 7590 04/10/2007

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EXAMINER	
LU, FRANK WEI MIN	
ART UNIT	**PAPER NUMBER**
1634	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/627,950	RADTKEY ET AL.	
	Examiner	Art Unit	
	Frank W. Lu	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-14,17-23,25 and 27* is/are pending in the application.

4a) Of the above claim(s) *10-14 and 21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-9,17-20,22,23,25 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

CONTINUED EXAMINATION UNDER 37 CFR 1.114 AFTER FINAL REJECTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission of RCE and the amendment filed on January 25, 2007 have been entered. The claims pending in this application are claims 1, 5-14, 17-23, 25, and 27 wherein claims 10-14 and 21 have been withdrawn due to species election. Rejection and/or objection not reiterated from the previous office action are hereby withdrawn in view of the response filed on July 5, 2006.

Claim Objections

2. Claim 1 is objected to because of the following informality: "the first loci" and "the second loci" in the claim should be "the first locus" and "the second locus" since the word "loci" is plural of the word "locus".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 5 recites the limitation "different blocks" in the claim. There is insufficient antecedent basis for this limitation in the claim because claim 1 only requires one block. Please clarify.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 5-9, 17-20, 22, 23, 25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nerenberg *et al.*, (US Patent No. 6,468,742 B2, filed on April 12, 1999) in view of Lannuzzi *et al.*, (Am. J. Hum. Genet., 48, 227-231,1991).

Regarding claim 1, Nerenberg *et al.*, teach providing patient sample nucleic acids containing a first and a second locus having a first and second polymorphisms (ie., the single stranded target nucleic acids of interest in claim 38 such as amplicon 42 in Figure 4a) at a microarray site (ie., the electronically addressable microchip); providing a blocker (ie., the first reporter oligonucleotide in claim 38 such as reporter probe 43 in Figure 4a) that is complementary to the first locus containing the first polymorphism (ie., the region of the target nucleic acid of interest such as amplicon 42 that is complementary to the first reporter oligonucleotide), hybridizing the blocker with the first locus wherein the second locus is unblocked; providing a detectable discriminator (ie., the second reporter oligonucleotide in claim 38 such as reporter probe 44 in Figure 4a) that is capable of hybridizing with the second locus containing the second polymorphism (ie., the region of the target nucleic acid of interest such as amplicon 45 that is complementary to the second reporter oligonucleotide); hybridizing the detectable discriminators with the second locus containing the second polymorphism; and detecting the second polymorphism by detecting the presence of the discriminator at the microarray site (see abstract, columns 5-9, claims 1-125 in columns 27-38, and Figure 4a and 4b).

Regarding claims 5, 6 and 22, since Nerenberg *et al.*, teach that the capture sites in column 1 and 2 of the microchip receive a Hemochromatosis wild type and Factor V mutant while the sites in column 4 and 5 of the microchip are targeted with both Hemochromatosis and Factor V Heterozygotes, reporting is done sequentially, first with the allele-specific Hemochromatosis reporters (SEQ ID Nos. 11 and 12) and then the allele-specific Factor V reporters (SEQ ID Nos. 16 (CGCCTGTCCAG-CR6G) and 17 (TGCCTGTCCAG-Far Red), and

before Factor V reporters are passively hybridized, all remaining Hemochromatosis reporters are stripped from the microarray (see column 12, lines 14-45, column 20, lines 1-30, and claims 1, 16, and 17 in columns 27-29), Nerenberg *et al.*, disclose that different blockers (ie., allele-specific Hemochromatosis reporters and the allele-specific Factor V reporters) are provided to different sites (ie., the sites of columns 1, 2, 4, and 5) as recited in claim 5, the site comprises a site of an actively addressable electronic microarray as recited in claim 6, and the multiple patient samples (ie., Hemochromatosis wild type, Factor V mutant, and Hemochromatosis and Factor V Heterozygotes) are provided on multiple sites (ie., columns 1, 2, 4, and 5) of the microarray as recited in claim 22.

Regarding claim 7, Nerenberg *et al.*, teach that the addressable electronic microarray includes a permeation layer (see column 12, lines 49-67, column 13, lines 1-3, and Figures 1A and 1B).

Regarding claims 8 and 9, Nerenberg *et al.*, teach that the patient sample is amplified as recited in claim 8 wherein the amplification includes polymerase chain reaction (PCR) as recited in claim 9 (see claims 38 and 60-67 in columns 30-32).

Regarding claim 17, Nerenberg *et al.*, teach that at least two loci (ie., the location between the reporter probe 43 and 44 and the location between the reporter probe 44 and 41 on the amplicon 45) are unblocked (see column 21, lines 53-62 and Figure 4a).

Regarding claim 18, Nerenberg *et al.*, teach performing a screening step (ie., analyzing unknown hemochromatosis samples) (see column 19, lines 38-65).

Regarding claims 19 and 20, Nerenberg *et al.*, teach that the patient sample nucleic acid comprises multiple segments containing different loci (ie., the sites that two reporter probes 43

and 44 hybridize to) as recited in claim 19 wherein the multiple segments containing different loci are affixed to the same microassay site (ie., the site on the microchip) as recited in claim 20 (see column 21, lines 53-62 and Figures 4a and 4b).

Regarding claim 23, Nerenberg *et al.,* teach providing a labeled amplification control (ie., another reporter oligonucleotide such as the reporter probe 41 labeled with biotin in Figure 4a) that is capable of binding with the patient nucleic acid sample; and hybridizing the labeled amplification control to the patient nucleic acid sample (see Figure 4a and column 30, claim 31).

Regarding claim 27, Nerenberg *et al.,* teach providing a stabilizer (ie., probe 41) that is capable of binding with the patient nucleic acid sample (ie., amplicon 42) adjacent the at least one discriminator (ie., the probe 44) and hybridizing the stabilizer to the patient nucleic acid sample (see Figure 4a).

Nerenberg *et al.,* do not disclose that the patient sample nucleic acids containing a first and a second locus having first and second polymorphisms which are related to a genetic disease as recited in claim 1 wherein the genetic disease is cystic fibrosis as recited in claim 25. Although the examples in Figure 4a are used to identifying SNPs in the Mannose Binding Protein gene locus that correlates with susceptibility to sepsis in leukopenic patients and SNPs in the human HLA locus (see column 21, lines 63-67 and column 22, lines 1-6), Nerenberg *et al.,* teach that "the number of loci required for any particular test on the array vary depending on the application, with generally one for genetic disease analysis, one to five for tumor detection, and six, eight, nine, thirteen or more for paternity testing and forensics" (see column 13, lines 36-49) and the method taught by Nerenberg *et al.,* is used for "disease diagnostics, such as for the identification of polymorphisms in structural genes, regulatory regions, antibiotic or

chemotherapeutic resistance conferring regions, or for SNPs associated with speciation or used for determination of genetic linkage" (see abstract) and "the accurate detection of diseased states, especially clonal tumor disease states, neurological disorders and predisposition to genetic disease" (see column 9, lines 42-46).

Lannuzzi *et al.,* teach that a patient sample nucleic acids (ie., a patient sample comprising cystic fibrosis gene) contain a first and a second locus having first and second polymorphisms (ie., mutations in resides CF1154TC and ΔF508) which are related to a genetic disease as recited in claim 1 wherein the genetic disease is cystic fibrosis as recited in claim 25 (see page 230, left column).

Therefore, it would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to have performed the method recited in claim 1 wherein the patient sample nucleic acids contain a first and a second locus having first and second polymorphisms which are related to a genetic disease such as cystic fibrosis in view of the prior art of Nerenberg *et al.,* and Lannuzzi *et al.*. One having ordinary skill in the art would have been motivated to do so because Nerenberg *et al.,* teach that "the number of loci required for any particular test on the array vary depending on the application, with generally one for genetic disease analysis, one to five for tumor detection, and six, eight, nine, thirteen or more for paternity testing and forensics" (see column 13, lines 36-49) and the method taught by Nerenberg *et al.,* is used for "disease diagnostics, such as for the identification of polymorphisms in structural genes, regulatory regions, antibiotic or chemotherapeutic resistance conferring regions, or for SNPs associated with speciation or used for determination of genetic linkage" (see abstract) and "the accurate detection of diseased states, especially clonal tumor disease states,

neurological disorders and predisposition to genetic disease" (see column 9, lines 42-46). One having ordinary skill in the art at the time the invention was made would have been a reasonable expectation of success to perform the method recited in claim 1 using patient sample nucleic acids containing a first and a second locus having first and second polymorphisms which are related to a genetic disease such as cystic fibrosis.

Response to Arguments

8. Applicant's arguments with respect to claims 1, 5-9, 17-20, 22-25, and 27 have been considered but are moot in view of the new ground(s) of rejection. Note that above rejection under 35 U.S.C 103 is a new ground of rejection because the examiner uses different parts from Nerenberg *et al.,* for the rejection.

Conclusion

9. No claim is allowed.

10. Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CAR § 1.6(d)). The CM Fax Center number is (571)273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Lu, Ph.D., whose telephone number is (571)272-0746. The examiner can normally be reached on Monday-Friday from 9 A.M. to 5 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached on (571)272-0735.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

March 30, 2007

FRANK LU
PRIMARY EXAMINER